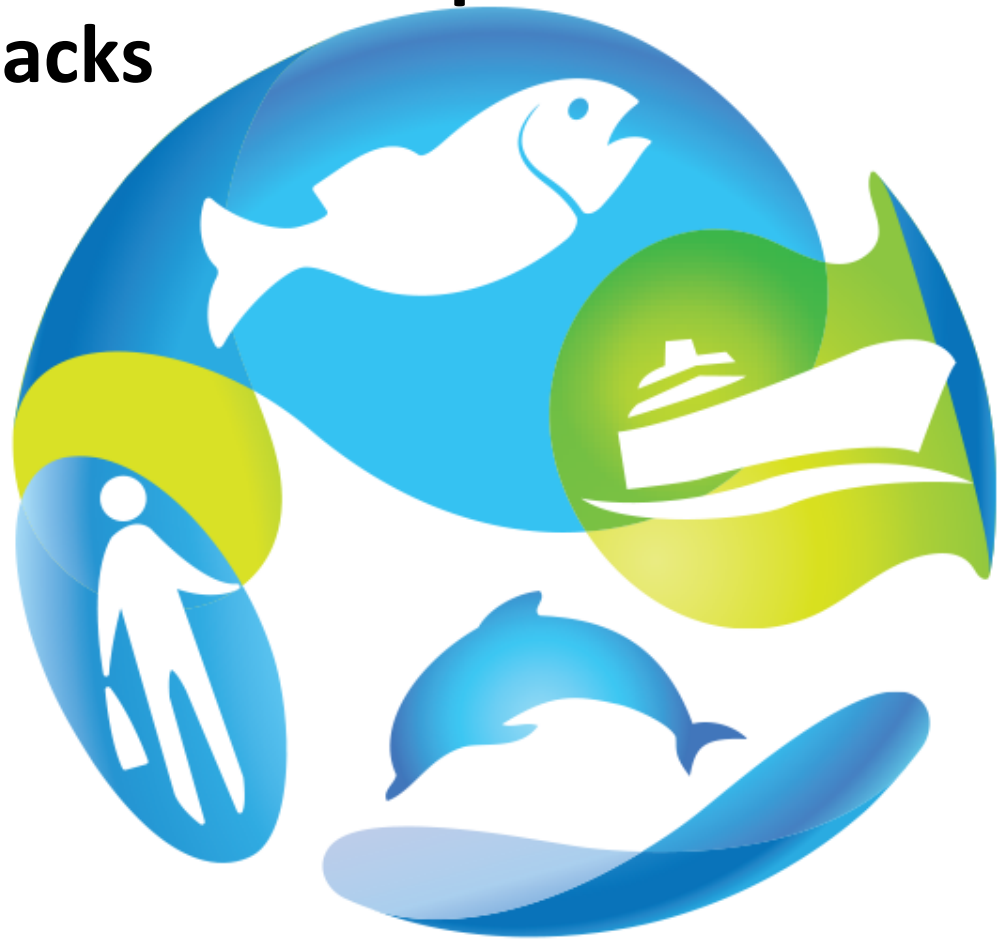
Bio-economic multi-stock reference points as a tool to overcome the drawbacks of landing obligation



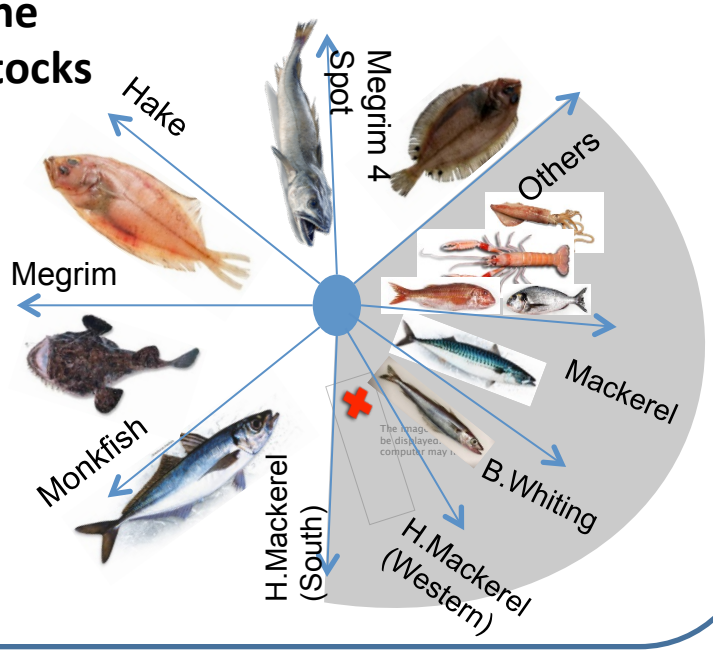
D. Garcia, R. Prellezo, P. Sampedro, J.M. Da Rocha, J. Castro, S. Cerviño, F.J. Garcia and M.J.Gutierrez

www.myfishproject.eu

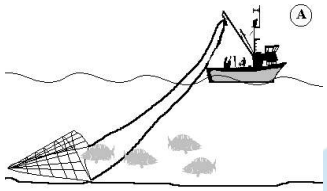
The Case Study

The Area

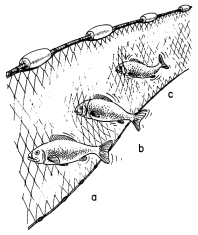
The Stocks



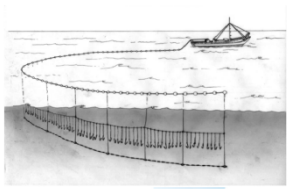
The Fleets



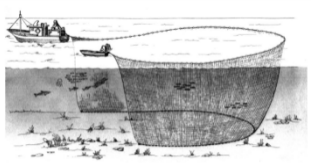
Trawl fleets
(Spain & Portugal)



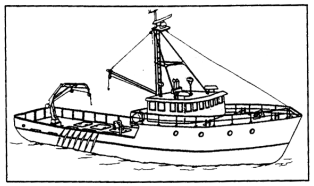
Spanish Gillnetters



Spanish vessels using hooks & lines



Purse Seine fleets
(Spain & Portugal)



Portuguese Polivalent

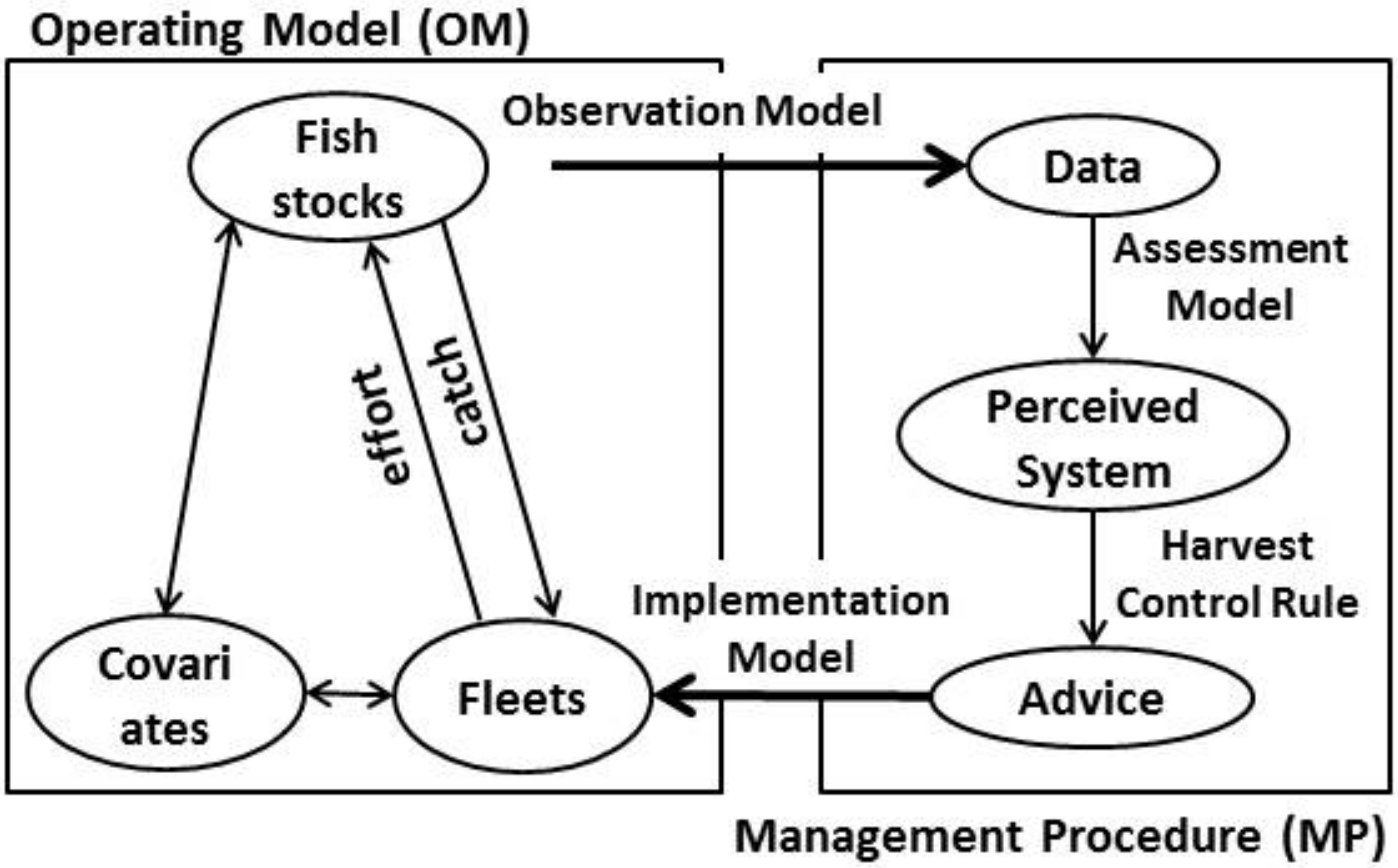
Motivation

Would multi-stock reference points produce more consistent single stock TAC advices and hence mitigate the negative economic effects of landing obligation policy?

The approach

FLBEIA bio-economic management strategy evaluation (MSE) software

FLR



Stock Dynamics

Hake, Megrims, Monkfish and Horse Mackerel

- Exponential survival equation + Stock recruitment relationship.
- Uncertainty in Recruitment: lognormal multiplicative error.

Rest of the stocks

- Biomass fixed along the simulation.
- Blue Whiting, Mackerel and Western Horse Mackerel's biomass equal to mean biomass in years 2010-2012.

Fleets Dynamics

Short Term

- **Traditional**: Effort share along metiers equal to historical average
- **Profit Maximization**: The effort share and total effort along metiers is such that maximizes the profits in each time step.

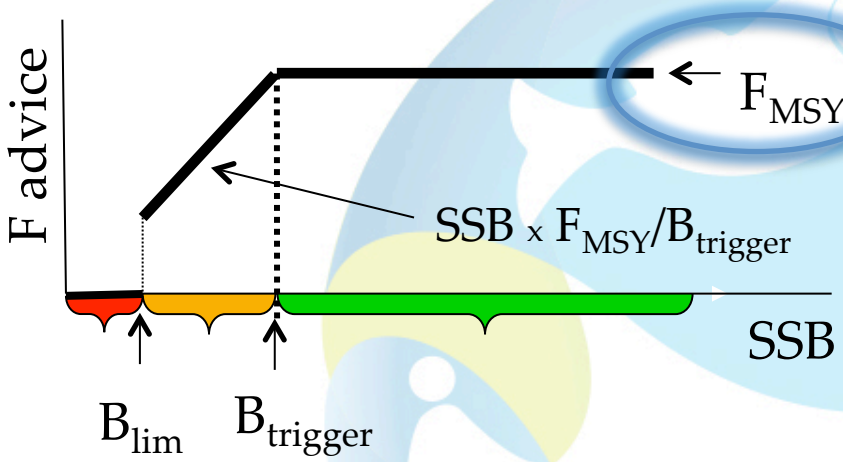
➢ **Landing Obligation:** None of the quotas can be exceeded

Long Term

- Number of vessels are updated for each fleet every year depending on the economic profitability of the fleet.
- Even if the fleet is profitable, if it is not employing its full capacity, number of vessels are not increased.
- The entry and exit of vessels is restricted to 3% a year.

Management Procedure

- Data and assessment simulated without error.
- ICES Harvest Control Rule:



Two sets of reference points:

- ICES MSY Reference Points
- Multi-Stock reference points calculated using a bio-economic optimization model.

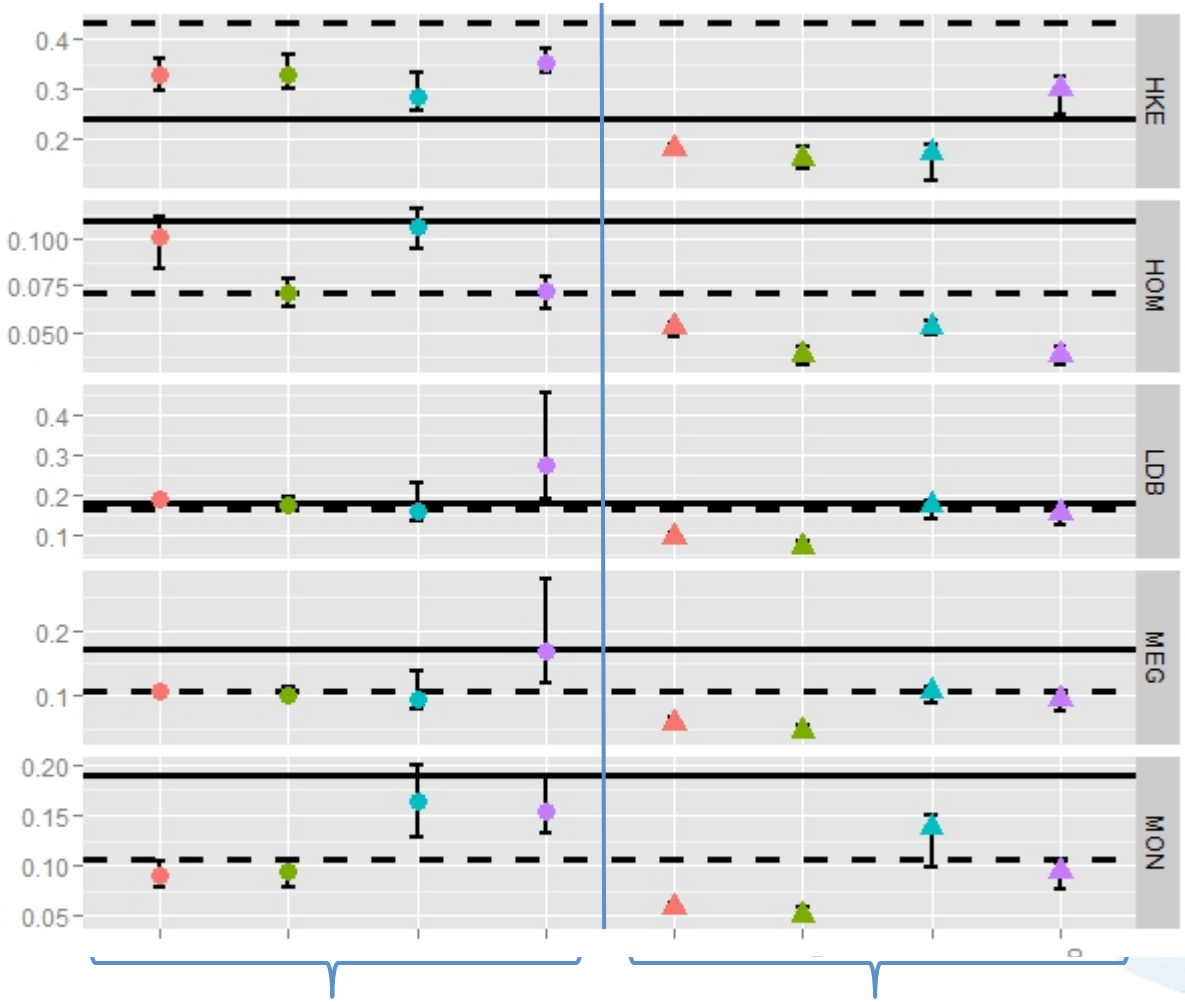
	ICES	MSMSY
Hake	0.24	0.43
H.Mackerel	0.11	0.07
Megrim	0.17	0.11
4 Spot Megrim	0.18	0.16
Monkfish	0.19	0.11

Scenarios

		Reference Points	
		Official	Multi Stock
Landing Obligation	NO	**ices**	**msmsy**
	Yes	**ices_lo**	**msmsy_lo**

- 8 scenarios: Each scenario above was run with two different fleet dynamics, traditional and profit maximization.
- Simulation period: 2015-2025
- Landing obligation applies from 2018 for all the stocks.

Fishing Mortality in 2025



Scenarios

- ices
- msmsy
- ices_lo
- msmsy_lo

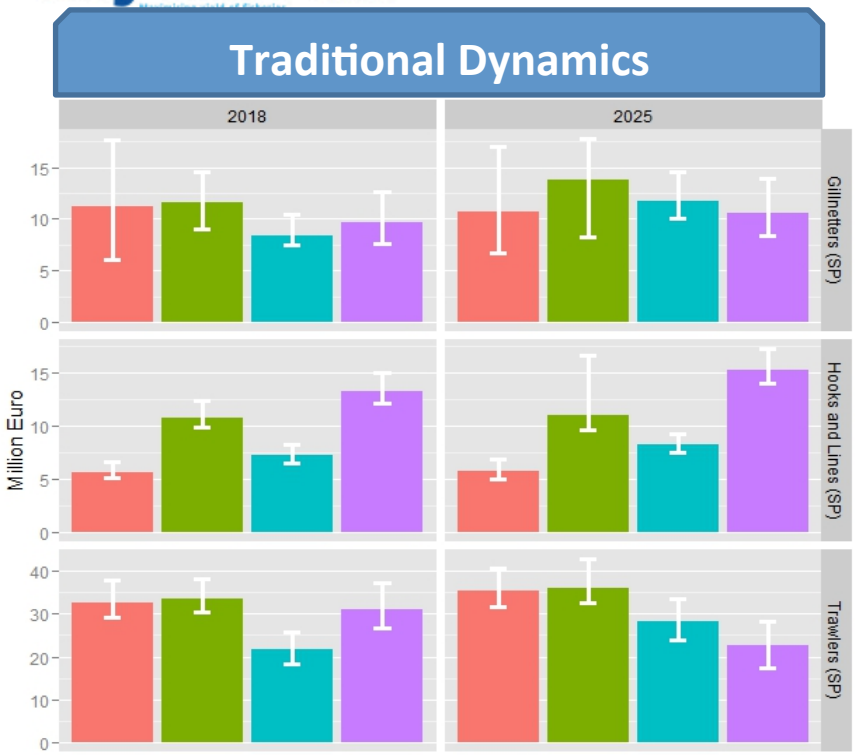
Reference Points

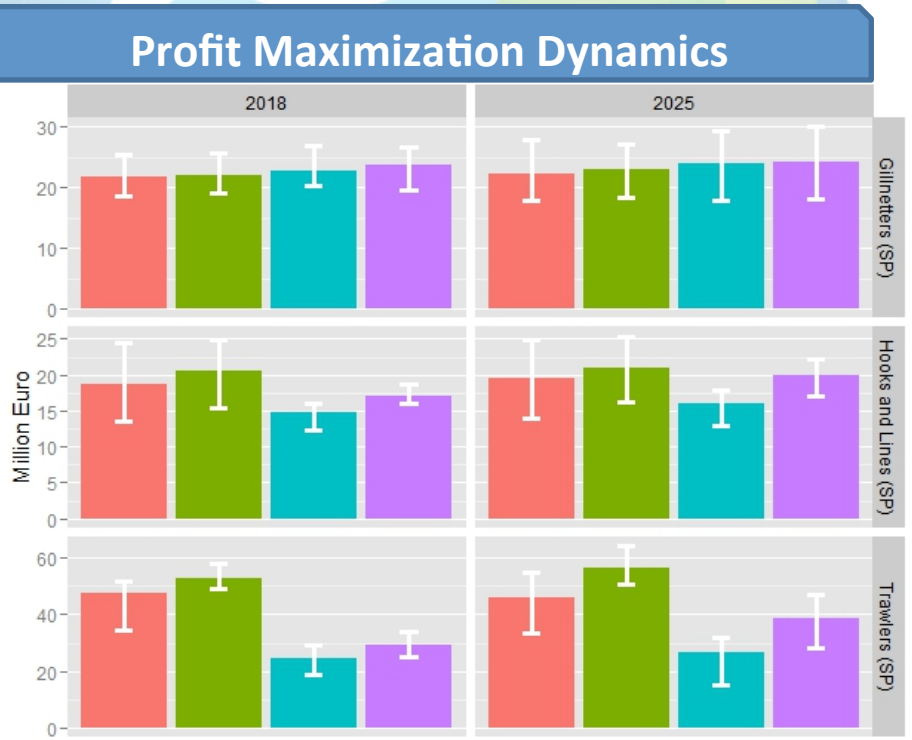
- official
- msmsy

Traditional
Fleet Dynamics

Profit Maximization
Fleet Dynamics

Profits



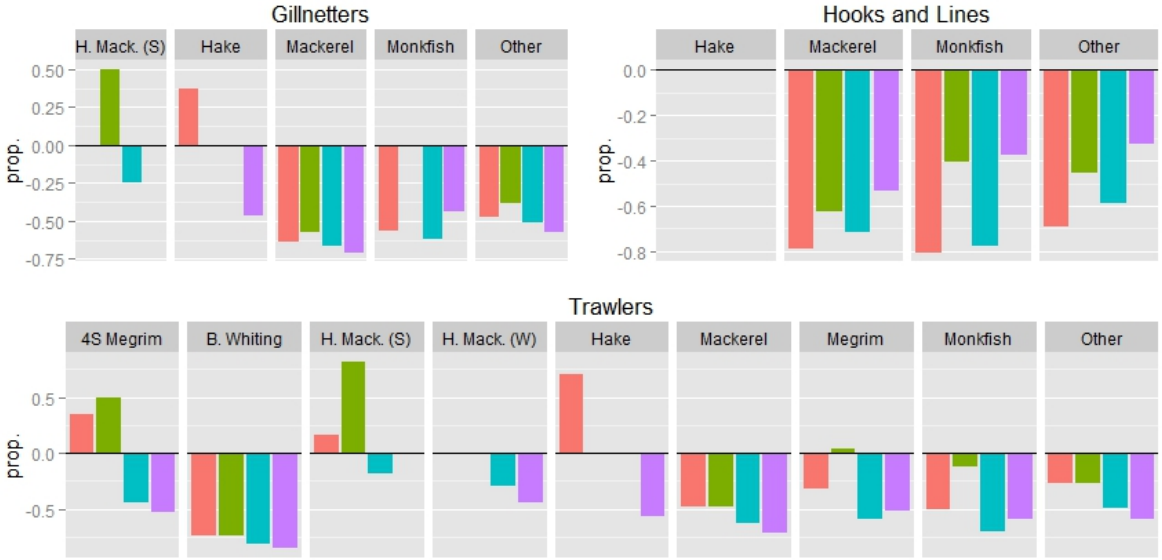


Scenarios

- ices
- msmsy
- ices_lo
- msmsy_lo

Long Term Quota Uptake

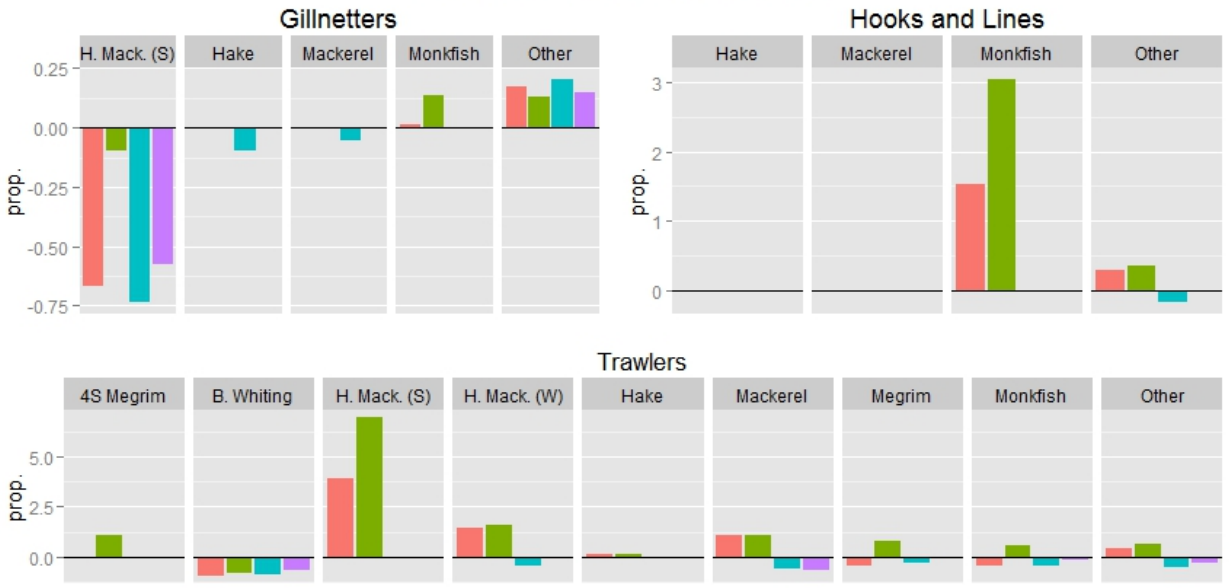
Traditional Dynamics



Scenarios

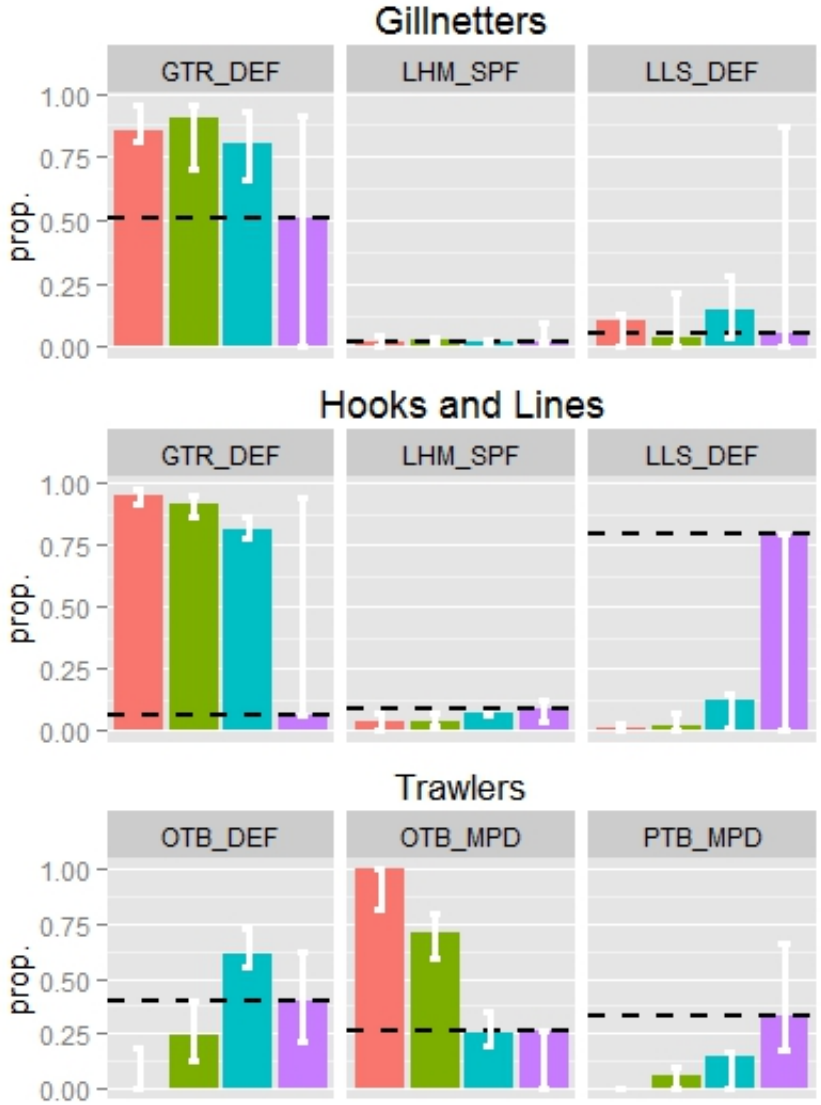
- ices
- msmsy
- ices_lo
- msmsy_lo

Profit Maximization Dynamics



Effort Share

Profit Maximization Fleet Dynamics



Net Present Value

Fleet Dynamics	Landing Obligation	Reference Point	Euros	Difference with current management
Traditional	No	ices	556	-
		msmsy	597	107%
	Yes	ices	517	93%
		msmsy	558	100%
Profit Maxmization	No	ices	888	-
		msmsy	969	109%
	Yes	ices	778	88%
		msmsy	870	98%

Conclusions

- Under landing obligation fishing opportunities are lost for all the stocks.
- The effect of landing obligation and multi-stock reference points depended on the fleet, the fleet dynamics and the time period.
- At fishery level, multi-stock reference points could neutralized the negative impact of landing obligation.
- Landing obligation and multistock reference points impact positively in the most selective fleets (Hookers).
- The loss in fishing opportunities of stocks not subject to quota system is key to the economic performance of the fleet.
- The fleets that can change their catch profiles to improve the consumptions of their quotas are less affected by the policy.

myfish
Maximising yield of fisheries while balancing ecosystem, economic and social concerns

Ευχαριστίες!! Thank you!!

The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement no 289257 . This publication reflects the views only of the author, and the European Union cannot be held responsible for any use which may be made of the information contained therein.

www.myfishproject.eu